Given: $3x - 2 = 7$

$+2 = +2$ reflexive Property

$3x - 2 + 2 = 7 + 2$ addition

$3x = 9$

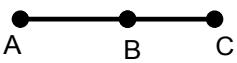
3.7 The postulates of Addition and subtraction

- **Partition** postulate - A whole is equal to the sum of it's parts

☆ write horizontal & vertical

This postulate applies to:

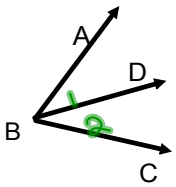
- Line Segments (any number, any length, congruence, measure)



① $\overline{AC} \cong \overline{AB} + \overline{BC}$

② $\overline{AC}$ $\overline{AB} + \overline{BC}$

- Angles (ADJACENT, any number, any measure, congruence, measure)



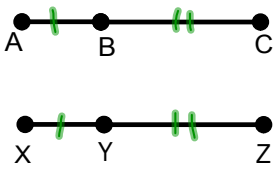
① $m\angle 1 + m\angle 2 = m\angle ABC$

② $m\angle 1 + m\angle 2$ $m\angle ABC$

- **Addition** postulate - If equal quantities are added to equal quantities, then their sums are equal. [If a = b and c = d then, a + c = b + d]

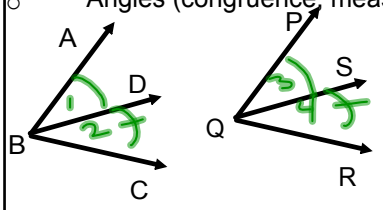
This postulate applies to:

- Line Segments of the same line (congruence, measure)



$\overline{AB} \cong \overline{XY}$ Given
$\overline{BC} \cong \overline{YZ}$ Given
$\overline{AB} + \overline{BC} \cong \overline{XY} + \overline{YZ}$ addition
$\overline{AC} \cong \overline{XZ}$ partition

- Angles (congruence, measure)



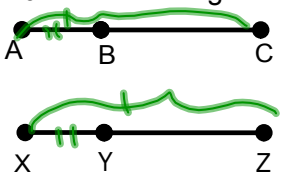
$m\angle 1 = m\angle 3$ given
$m\angle 2 = m\angle 4$ given
$m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$ addition
$m\angle ABC = m\angle PQR$ partition

- **Subtraction** postulate - If equal quantities are subtracted from equal quantities,
- then their differences are equal. [If a = b and c = d then, a - c = b - d]

☆ We never write '—' in proofs.

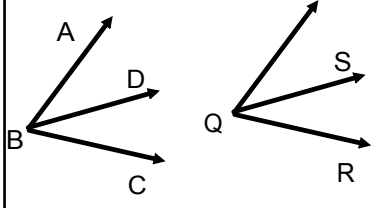
This postulate applies to:

- Line Segments (congruence, measure)

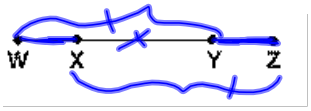


$\overline{AC} \cong \overline{XZ}$ given
$\overline{AB} + \overline{BC} \cong \overline{XY} + \overline{YZ}$ partition
$\overline{AB} \cong \overline{XY}$ given
$\overline{BC} \cong \overline{YZ}$ Subtraction

- Angles (congruence, measure)

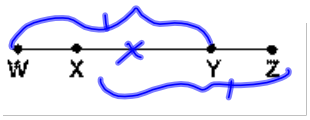


method 1 - partition with substitution

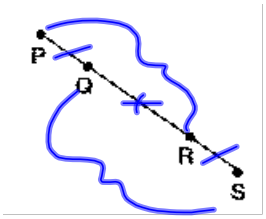


Statements	Reasons
1. WY = XZ	1. GIVEN
2. WX + XY = WY XY + YZ = XZ	2. Partition
3. WX + XY = XY + YZ	3. Substitution
4. XY = XY	4. Reflexive Property
5. WX = YZ	5. Subtraction

method 2 - partition without substitution

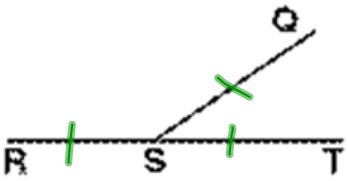


Statements	Reasons
1. WY = XZ	1. GIVEN
2. WX + XY = XY + YZ	2. partition
3. XY = XY	3. reflexive Property
4. WX = YZ	4. Subtraction



Statements	Reasons
1. PQ = RS	1. GIVEN
2. QR = QR	2. reflexive Property
3. PQ + QR = QR + RS	3. addition
4. PR = QS	4. Partition

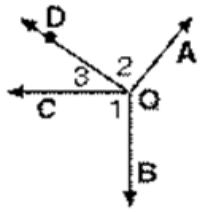
Given: S is the midpoint of $\overline{RT}$
ST = SQ
Prove: RT = SQ + ST



Statements	Reasons
1. S is the midpoint of $\overline{RT}$	1. given
2. ~~RS = ST~~	2. if a point is a midpt it makes 2 = segments.
3. RS = SQ	3. transitive property
4. RT = RS + ST	4. Partition
5. RT = SQ + ST	5. Substitution

Given: $\overrightarrow{QA} \perp \overrightarrow{QD}$
$\overrightarrow{QB} \perp \overrightarrow{QC}$

Prove: $\angle BQD \cong \angle AQC$



Statements	Reasons
1. $\overrightarrow{QA} \perp \overrightarrow{QD}$, $\overrightarrow{QB} \perp \overrightarrow{QC}$	1. _____
2. $\angle 1, \angle 2$ are right $\angle$'s	2. _____
3. $\angle 1 \cong \angle 2$	3. _____
4. $\angle 3 \cong \angle 3$	4. _____
5. $\angle 1 + \angle 3 \cong \angle 2 + \angle 3$	5. _____
6. $\angle BQD \cong \angle AQC$	6. _____

Using Partition with Addition and Subtraction

Partition

*alphabetical order
*no '-'

Addition

Subtraction

Homework: worksheet

The Partition-Partition Substitution method...

Statements	Reasons
1. WY = XZ	1. GIVEN
2. WY = WX + XY XZ = XY + YZ	2. partition
3. WX + XY = XY + YZ	3. substitution
4. XY = XY	4. reflexive property
5. WX = YZ	5. subtraction